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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,682	02/09/2006	Yoshiharu Wakao	330700US0PCT	4473
22850	7590	12/22/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			STELLING, LUCAS A	
			ART UNIT	PAPER NUMBER
			1797	
			NOTIFICATION DATE	DELIVERY MODE
			12/22/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,682	<b>Applicant(s)</b> WAKAO ET AL.	
	<b>Examiner</b> Lucas Stelling	<b>Art Unit</b> 1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 is/are allowed.
- 6) ☒ Claim(s) 10-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10-16-08 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 11 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims are considered indefinite because the parent claim 10 recites the species in a Markush format which does not require all species enumerated to be used in combination, but claims 11 or 16 could be taken as a further narrowing of the concentration, or mode of operation, of each species if and only if present in the prior art, or claims 11 and 16 could be taken as requiring all species used in combination together within the concentration ranges, or mode of operation, claimed, and thereby essentially negating the Markush-type relationship. Therefore, these claims are amenable to two or more plausible and mutually exclusive claims constructions. For purposes of examination claims 11 and 16, will be taken to further

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limit the concentration or mode of operation of each species if and only if present in the prior art that is used to address the limitations of claim 10.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 10-13 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,256,423 to Egusa et al. ("Egusa") in view of Ikuta.

6. As to claim 10, Egusa teaches treating ballast water with peroxide in the amount of 10 to 500 mg/L (**Egusa col. 3 lines 20-35**), but does not teach the use of either ferrous ion, catalase, or iodine used in combination with the water. Ikuta teaches using peroxide in combination with ferrous ion (**page 449, especially col. 2 lines 25-30, FeSO<sub>4</sub> used at 0.25 ppm**), which produces a synergistic result (**Ikuta conclusion**), in reducing biofouling in sea-water intakes for heat exchangers (**page 449, introduction section**). Furthermore, it is noted that the combination of peroxide and ferrous ion produces the Fenton's reagent which is an extremely reactive oxidative hydroxyl radical. Under Rationale C of *KSR v. Teleflex*, ferrous ions in combination with peroxide being used to treat ballast water constitutes the use of a known technique (**providing peroxide in conjunction with ferrous ions is used to prevent biofouling in Ikuta**) to improve similar devices (**ballast water and heat exchanger intake water are similar because both draw from sea water and it is desirous to remove biofouling species**) in the same way (**providing the ferrous ions in conjunction with peroxide**

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**in the ballast water provides the predictable results of more effective because a synergistic effect is shown in treating seawater intakes for heat exchangers).**

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide ferrous ions in the method of Egusa. See MPEP 2143 and 2143(C).

7. As to claim 11, Egusa teaches that the peroxide is used in a range of 10 to 500 mg/L, and Ikuta teaches using ferrous ion in 0.25 ppm range. A person of ordinary skill in the art at the time of invention would recognize the increased reactivity of the Fenton's reagent, and therefore a need for less peroxide added to control biofouling.

*Discovery of optimum value of result effective variable in known process is ordinarily within the skill in the art and would have been obvious, consult In re Boesch and Slaney (205 USPQ 215 (CCPA 1980)).*

8. As to claim 12, the use of sodium percarbonate is contemplated **(Egusa col. 3 lines 18-20).**

9. As to claim 13, Ikuta teaches the use of ferrous sulfate as the source of ferrous ions **(page 449).**

10. As to claim 16, hydrogen peroxide is diluted using seawater to produce a treating solution with a desired concentration **(Egusa col. 4 lines 10-20).** It would have been obvious to a person of ordinary skill in the art to apply this same method of producing a desired concentration of ferrous ion.

11. As to claim 17, the peroxide compound contacts the water for 3 to 40 hours **(Egusa col. 3 lines 35-45).**

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12. As to claim 18, hydrogen peroxide is added to the ballast water (**Egusa col. 4 lines 15-20**).

13. As to claim 19, a compound producing hydrogen peroxide is taught to be an obvious equivalent of peroxide (**Egusa col. 3 lines 30-33**).

14. As to claims 20 and 21, Ikuta teaches ferrous sulfate, a source of ferrous ions is used in combination with peroxide.

15. Claims 10, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egusa in view of Kozo as well as the Derwent abstract of Kozo.

16. As to claims 10 and 22, Egusa teaches treating ballast water with peroxide in the amount of 10 to 500 mg/L (**Egusa col. 3 lines 20-35**), but does not teach the use of either ferrous ion, catalase, or iodine used in combination with the water. Kozo teaches the combined use of peroxide and catalase to prevent fouling by marine organisms (**Kozo abstract, see also Derwent abstract, the use of peroxide and catalase provides a synergistic effect**). Under Rationale C, the use of catalase in addition to peroxide in the method of Egusa constitutes the use of a known technique (**providing catalase in addition to peroxide**) to improve similar devices (**Egusa is concerned with ballast water, and Kozo is concerned with water intake for industrial heating/cooling processes, but both are similar because they draw from seawater and seek to mitigate the effects of biofouling**) in the same way (**the catalase will provide synergistic effect with the use of peroxide, the benefit of which would be recognized by a person of ordinary skill in treating ballast water**). Therefore, it

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would have been obvious to a person of ordinary skill in the art the time of invention to provide catalase to the water in Egusa.

17. As to claim 14, these are common and ordinary sources of catalase, and the source of catalase does not appear particularly critical to the outcome of the method.

18. Claims 10, 15, 23, and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Egusa in view of Keisuke.

19. As to claims 10 and 23, Egusa teaches treating ballast water with peroxide in the amount of 10 to 500 mg/L (**Egusa col. 3 lines 20-35**), but does not teach the use of either ferrous ion, catalase, or iodine used in combination with the water. Keisuke teaches using peroxide in addition to a source of iodide ions to produce hypiodous acid inexpensively and safely to sterilize a water system (**Derwent abstract and Keisuke [0021] 20mg/L is contemplated**). The use of hypiodous acid is inexpensive and prevents metallic corrosion, also pH changes in the water do not affect sterilizing activity (**Derwent abstract**). Therefore, it would have been obvious to a person of ordinary skill in the art to add an iodide ion source to the method of peroxide treatment in Egusa to produce hypiodous acid in order to prevents metallic corrosion, and not let pH changes affect water sterilization.

20. As to claim 15 and 24, potassium iodide and or ammonium iodide are a readily available source of iodine ions which are easy to store. Therefore, it would have been obvious to use potassium iodide or ammonium iodide. Also, the source of iodide does not appear to be particularly critical to the outcome of the method.

***Allowable Subject Matter***

21. Claim 25 is allowed.

22. The following is a statement of reasons for the indication of allowable subject matter: Egusa is the nearest prior art but it does not teach, nor does it fairly suggest the use of peroxide, ferrous ion, catalase, and iodine, together within the specific ranges claimed, used to treat ship ballast water such that organisms are exterminated without depleting a viable oxygen level.

***Response to Arguments***

23. Applicant's arguments filed 10-16-08 have been fully considered but they are not persuasive.

24. In response to applicant's argument that rigidly combined teachings of Shozu (Egusa) with the secondary references does not produce the claimed method, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Furthermore, biofouling and extermination of unwanted species is a common problem when large quantities of sea-water is used in industrial processes and shipping; it is within the skill of a person of ordinary skill in the art in the shipping designing art to



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borrow from the industrial processes art with a reasonable expectation of success because both are concerned with preventing marine organisms from interfering with the overall operation of the industrial process or ship operation.

25. In response to applicant's argument that Shozu (Egusa) and Kozo do not teach maintenance of desired oxygen levels, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.

See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

26. In response to applicant's argument that Kozo teaches away from the combination with Shozu(Egusa) because Kozo teaches that combination prior to injection decomposes the peroxide, it is noted that the features upon which applicant relies (i.e., the specific order, timing, and method of adding the chemicals to the ballast water) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It would be perfectly reasonable and within the skill and knowledge of a person of ordinary skill in the art to apply the method of sequential addition of catalase and peroxide in combined method of Egusa and Kozo.

27. In response to applicant's argument that the combination of Keisuke with Egusa does not teach within the ranges claimed. as to the relative concentrations of peroxide and iodine, claim 10 allows for the stoichiometric excess found in Kozo by covering large ranges for the amounts of peroxide and iodide.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucas Stelling whose telephone number is (571)270-3725. The examiner can normally be reached on Monday through Thursday 12:00PM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

las 12-17-08

/Duane S. Smith/  
Supervisory Patent Examiner, Art  
Unit 1797